



HARDWOOD LANDS.

D. A. WALLACE.

Hardwood Timber Lands

The Peculiarities, the Characteristics, and the
Possibilities of Hardwood Timber Land Heretofore
Overlooked as Suitable for Agriculture

BY
D. A. WALLACE



Hardwood Land Products

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PREFACE.

The time is near at hand when all good agricultural lands, no matter where located, will be occupied. "Cut-over lands," are peculiar in that the ordinary land seeker has no definite ideas of the soil, timber, and agricultural possibilities of the lands thus designated. Believing that information concerning this class of land would be gladly received by thousands of farmers or would-be farmers, about to change their location, there seems to be a field for a booklet of this nature. It has not been the idea to make it a text book, or a book of complete instruction for the northern farmer. For this information the settler can go to the experiment stations, located in the cut-over land districts. These stations are working out the farm problems peculiar to this section of country, and are aiding the farmer in all phases of his work. But it has been the purpose to convey to the reader a general idea of the peculiarities, the characteristics, and the possibilities of a class of land hitherto overlooked as an agricultural proposition.

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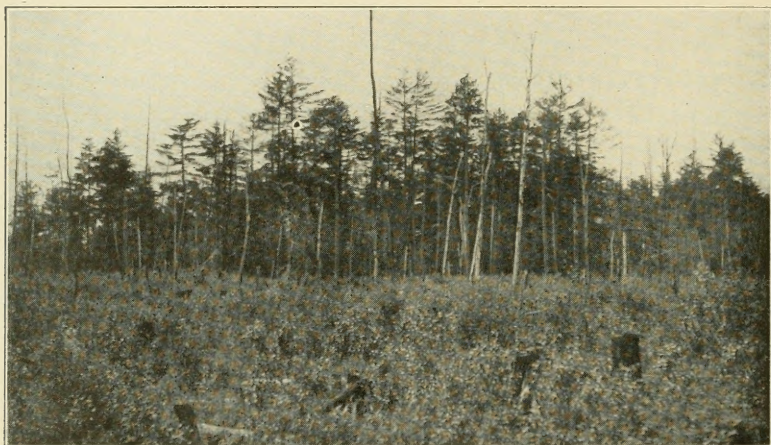
THE LAND SITUATION.

Scarcity of cheap lands—No more free lands
—Some good farm lands previously over-
looked—Cut-over lands—Compari-
son of timber and prairie land—
Northern soil.

During the last five years there has been a wonderful migration into the unoccupied sections of the United States and Canada in search for good farm lands. The demand for land has been unprecedented, and it has led all classes of people to invest their savings in fertile acres before the time comes when all available farm lands in the United States will be occupied. In contrast to years ago, when a splendid farm could be obtained by homesteading, or purchasing at a low price, in Iowa, Minnesota, Dakota, Nebraska and Kansas, nowadays the land for the farm home must be purchased. Fifteen years ago, or even less, the most desirable farm lands in Northwestern Iowa and adjacent communities, as well as in Nebraska, Kansas and Southern Minnesota, could be bought at a price almost as low as is today asked for the least desirable of farm land. There were many instances in Iowa, twelve or fifteen years ago, where splendid farms could be purchased at from \$10 to \$20 an acre. The same lands today are worth from \$60 to \$100. The same phenomenal rise in the value of farm lands has occurred in all parts of the United States, due to immigration, increasing home population, and the occupying of free land, as well as the general hunger for land that possesses the people in times of prosperity. The past five years have seen a wonderful emigration from the central states in the direction of Northern Minnesota, the Dakotas and Canada. There has likewise been a migration to the western states of Kansas, Nebraska, and even out to the coast states of Washington, Colorado, Oregon and Montana. The southern cheap lands in Oklahoma and Texas

have also attracted many homeseekers. The situation has now come to the point where cheap lands all over the United States have nearly passed the speculation point, and are so dear, in many instances, at the prices asked, that they can be no longer looked upon as cheap lands.

There is a large section of country, however, which has hardly received its due share of attention; a country which has not



Typical "Slashing" Ready for Farming.

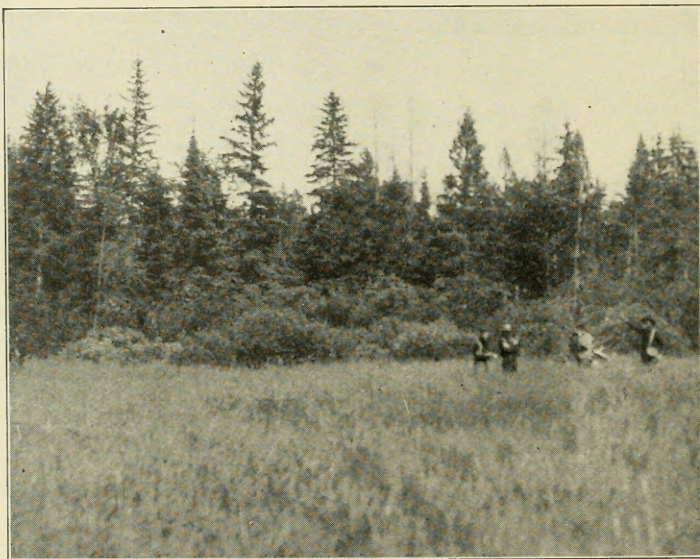
been appreciated at its full worth, and which has been put in a prejudiced light before the land seekers. We refer to those sections of Northeastern Minnesota, Northern Wisconsin, and the Upper Peninsula of Michigan which have been termed "Cut-Over Lands."

This section of country was originally a forest region, ranging all the way from solid hardwood land, and hardwood lands with mixed prairies, to dense forests. The pine has been largely cut off or burned, and the lumberman has moved further north and west, and the lands for some time have been ready for the land seeker. A few years ago this land was considered practically worthless for agricultural purposes, the timber being considered

its chief asset at that time. But the pioneer farmers who settled along the lumber camps found that the land was so wonderfully productive of grains and grasses, and was so well suited to the various forms of the live-stock industry, that the question of its agricultural future soon came to be an assured matter and merely a question of time. The sections of this country which have been developed—and there are many wonderfully prosperous countries, towns and communities—indicate that in certain respects this country has no superior or even equal.

Soil. The soil of the typical cut-over country is of a very peculiar nature, and possesses certain characteristics which other soils do not possess. It is essentially a glacial drift, deposited hundreds of years ago by the action of glaciers. It is composed of extremely fine particles of mineral matter, and is almost like powder in its texture. There is but little distinction between soil and subsoil, it being all of the same character for many feet down. It ranges from a more or less sandy soil to the heaviest clay, with intermediate admixtures according to the way in which the sand or clay predominate. There is sandy loam, sandy clay loam soil, with a very slight admixture of sand, and the heavy clay soils. The clay lands are divided into the white and the red clay, the latter being impregnated with iron, and being distributed usually in the vicinity of the Great Lakes. All of these clays seem to be equally useful from the farmer's standpoint, and to be wonderfully productive of grasses, root crops, and small grains. The red clay is perhaps a trifle colder and a little harder to get into a cultivated state, but a splendid producer of grass. The sand in the North is not as great an objection as would be supposed, the climatic conditions being fortunately so arranged that the sand merely acts as a soil warmer and as a loosener of the heavy clays. The soil which has enough sand in it to make it open, friable and warm, and which at the same time has enough clay in it to give it body and make it compact, is an ideal soil, especially in the North. The largest share of the cut-over country is blessed with just this kind of soil.

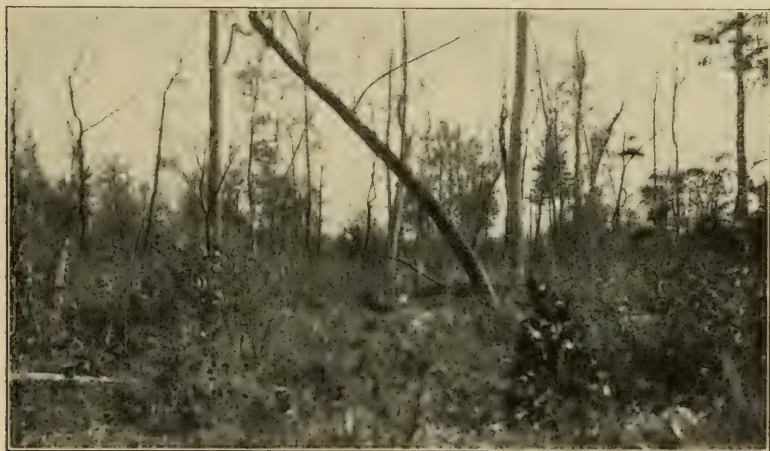
We have no desire to speak disparagingly of any section of the United States as to the lands open to the homeseeker. The place he will locate is entirely a matter for the landseeker to decide. He should, however, remember certain facts which go to make up a desirable country, and consider well not only what the country is good for at the present time and under present weather and season conditions, but should consider well the future and permanent system of agriculture which that country will have to adopt. For



Typical Tamarack Swamp. Volunteer Blue Joint Grass in Foreground.

instance, if a man goes to Canada or the Dakotas, he should know not only that he is going to raise wheat for a few years, but he should also consider what he is going to do when the inevitable time comes when he cannot raise wheat. He should consider the past history of the country he is going into, and judge by that as well as the present. The last four years have been very unusual years from the standpoint of rainfalls, and are a poor criterion by which to judge any country, whether it be the Dakotas, Canada or the central states. Lands in the corn belt which have hitherto been

extremely productive have been drowned out and rendered almost worthless during the last four years. On the other hand, semi-arid lands that have never been wet enough to grow any considerable crop have surprised even the best friends of the country by their unusual crops. In comparing the prairie country with the cut-over country, there are also other considerations aside from moisture. The Minnesota, Wisconsin and Michigan farmer has unfailing fuel, the cheapest of lumber, and work all the year around at remunerative wages. Considering the past of the cut-over country, we find that there have never been extremes of humidity or drouth, this fact being due, no doubt, to the influence of climatic conditions which is exerted by the proximity of the Great Lakes. The soil in that country is especially adapted to the draining off of the surplus water, and, being very fine in texture, is also especially retentive of moisture in dry years, so that we may reasonably expect average conditions year after year. The question as to the value of cut-over lands depends on the ease of clearing, the crops that can be grown, nearness to market, and the systems of farming, all of which subjects will be discussed later in this booklet.



Cut-over Timber Land. The Pine Has Been Removed and Hardwood Timber Left.

SELECTING LAND.

Selection important—Indication of good timber land—Hard-wood land—Swamp land—Pine land—Indications of kinds of grasses.

After the question of state and locality has been settled the remaining considerations are the soil and the ease of clearing. Too much stress cannot be laid upon the proper selection of land for the future farm. Aside from the consideration of the soil and its richness, the value of the land depends on the ease of clearing. Land that is burdened only by a small amount of brush and no windfalls or pine stumps is almost equal in value to the best of prairie soil. Selecting cut-over land is a different matter from selecting prairie land, and the prairie farmer will probably be somewhat disappointed on first inspection. It needs full acquaintance with actual conditions to realize the full measure of the manifest advantages. Cut-over land can be very accurately judged by the growth of grass and timber which it is producing, or which has been produced and later removed by the lumberman's axe or by fire. A mixed growth of hardwood timber, such as maple, ash, basswood, ironwood, and oak, usually indicates a very excellent heavy clay soil with slight admixture of sand. A good growth of hardwood is very desirable, both from the standpoint of good land and because when made into cord wood it furnishes profitable employment, and, if at all abundant, will go a long way toward paying for the land and cost of clearing. Any of the large northern cities, such as St. Paul and Minneapolis, furnish a ready market for cord wood. The price will range from \$3.00 to \$6.00 a cord on board the cars. The most valuable wood is hard maple or birch, after which come ironwood, oak, and ash in the order named.

Next to the solid hardwood growth lands come the lands with mixed hardwood and interspersing white pine, although in many

cases this kind of growth will indicate just as good land as the first mentioned. Of swamp lands there are three kinds,—the natural meadow, the swamp containing such timber as tamarack, spruce and cedar, and the swamp known as “Muskeg.” The natural meadow is always valuable for its hay, the timbered swamp can readily be turned into cash in the form of fence posts, ties and telegraph poles, and after being cleared and drained makes excellent meadow.

Mixed hardwood land with a little swamp land makes a good selection for the farm. The hardwood furnishes fuel, and the swamp cedar and tamarack, when cut green, make the best of fence posts.

A heavy growth of Norway or Jack pine usually indicates a



Typical Open Land, Practically Ready for the Plow.

rather sandy land. A sandy soil is not necessarily a poor soil, as is generally supposed. With clover and a good number of live stock, it often makes the best farming land, especially for the growing of potatoes, roots, and truck gardening. Sandy soil will not stand the same abuse as clay soil, but under a good system of farming a soil which is not all sand has many advantages. Hazel brush growth indicates good, rich land. Mixed hardwood brush comes next. Willow and alder brush denote wet spots. As for

indications as shown by grass, cat-tails and flags indicate standing water, blue stem indicates occasional wet spots, and red top fairly dry land. When properly drained, tame grass will supplant all these wild grasses. It must not be understood that these are infallible rules, but for the landseeker who is unacquainted with the conditions they can be taken as fairly accurate guides where the land is not sufficiently bare to show for itself.

The buyer may classify the different kinds of land into fairly distinct classes. There are the timber lands proper, which present about the same appearance as ordinary timber lands, and which must be entirely cleaned up before available for farming purposes, but which, however, afford considerable revenue by the sale of logs and cordwood, in many cases enough to pay for the land. There can also be found open lands which have been either burned over or cut-over. This class of land presents an opportunity for the farmer to get to work immediately on the farm by breaking and seeding for meadow. Then there is the third class, known as "swamp lands," being either natural meadows or lowlands grown up to tamarack, spruce and cedar. The selection between the three classes will depend on the use to which the landseeker chooses to put the land.



Dynamiting a Stump.

CLEARING.

Clearing with stock -- Use of clover and timothy--Handling logs and down stuff--Pine stumps--Dynamiting--Turpentine factories.

The clearing of the farm depends a great deal on the object in view. The man without money, who must depend altogether on his own efforts, will find the work rather slow on account of interruptions in his time, and he will also soon find that live stock will do a large share of the work more easily and cheaply than he can do it. This one thing must be kept in mind: that farming in Northern Minnesota, Northern Wisconsin, and Northern Michigan is best as a live-stock proposition, and the farmer must keep the live-stock end of it in mind when he figures on the clearing. The brush can be left in the pasture and will be gradually beaten down and largely disappear through the tramping of stock. As soon as the brush is beaten down sufficiently to allow sunlight to come in white clover will volunteer, and the second year any brush land, when pastured sufficiently, will bring very good pasture grass.



The Results of a Well Placed Charge of Dynamite.

Angora goats are probably the best as brushers. The skeptic who has laughed at goat stories will be convinced after seeing a flock of them at work that the stories have not been exaggerated as to their brush-destroying abilities. They will annihilate small brush and twigs, both on the ground and as high up as they can reach. They will bark the trees and ride down anything that can be reached and bent over.

Sheep will also do very effective work in clearing, their work being confined mostly to the small brush and the grass. While not being capable of doing quite as effective work in the way of clearing brush, they will probably give more profit in themselves



Pulling a Refractory Dynamited Stump.

while doing the work. Cattle and horses, tramping through the brush to obtain the wild peas and other succulent wild vines and grasses upon which they thrive, will also do good work in clearing, especially where confined sufficiently. Their work is largely preparatory, however, and the farmer, after pasturing his land for a year or two, can come in and clear it off with half the work that would have been necessary in the first place. At the same time his milk cows or sheep have been giving him a little income. The wild brush lands are surprisingly rich in pasture feed and although

any one unacquainted with conditions would wonder that they could pick up much food, nevertheless cattle and stock of all kinds, when having sufficient range, will carry more hard flesh than they would on many tame pastures. Another chapter of this booklet devoted to wild vetches will partially explain this. It is well to remember that the brush pastures are rather warm in summer, and after a wet spell there will be a considerable number of mosquitoes. It is well to have a little cleared space, where the wind can strike, in which the stock can rest on hot days.

When the farmer wants to clear up brush land for breaking



Stumps Piled for Burning.

and for meadow, he can, by observing a few points, save himself a great deal of bother and work. If he intends to clear for meadow, he should have previously gone through the brush and scattered a full seeding of clover and timothy. If he has done this, he ought to have a fair stand of tame grass the second year, especially if the seed was sown on ashes, and when the brush is cleared off will have a first-class meadow. I know of no place in the United States where tame grass will catch as readily as in the cut-over lands. This country has come to be known as "The Land of Big Red Clover," and it is certainly true that tame grasses of all kinds flourish like weeds. A good meadow can often be obtained

without plowing the land. The grass seed can be sown in the brush at any time of the year, preferably in the spring on a wet day or on ashes after a burn. It is a very good system to run a fire in the spring of the year, which will kill all the brush about to leaf out by blistering the outside bark or cambium layer, thus shutting off the supply of moisture in the ground. After the burn, it is well to go in and seed your clover and timothy on the



Timothy and Clover in a Homestead Clearing. Virgin Forest in Background.

ashes, pasture it that year, and clear off for meadow the next season.

When it comes to cutting brush, there are proper times to do this, and proper times to leave it alone. The best time is from the middle of July to the last of August, when the sap is mostly in the leaves and stem and the plant is storing up winter food. If cut at this time, the brush roots are effectually shut off from the source of food, and will make a very sickly growth the next season. A little pasturing will keep them in subjection. When cut at any other time of year, unless a good fire has followed and effectually seared off the stubs, a second cutting will be necessary, and possibly a third, to get rid of the shoots. The brush can be

cut over very close to the ground, which is called "close cutting." This method is usually the most favorable, in the long run, with small stuff, although the first operation costs a little more money. Large trees must necessarily be cut a little higher up and allowed to rot. One method which is used in handling poplar and like saplings is to cut them off about three feet above the ground. The next season they can be easily twisted over, there being no suckers and the roots being rotted. Small trees up to four and



Road Making Through the Virgin Forest.

five inches in diameter can be readily pulled out by a team. The roots on one side are cut, and with a long rope the tree is pulled over prostrate. The roots on the other side are then cut, and the tree dragged off.

The handling of the windfalls and down logs is a matter of short work with an experienced man who knows how to handle a team of experienced woods horses. The implements required are a pair of spreaders or double-trees, a trained team of woods horses, and a scoot or frog, as it is called, upon which to roll one

end of the log and upon which to drag it. It is merely a skeleton sled, to which the team is attached by a chain, which holds the log in place also. It saves all the bumping and twisting that would otherwise happen in dragging the log along the ground. The same "scoot" is used in the lumber woods for skidding logs. The logs are all dragged up in a pile, and decked up in a way similar to the loading of a logging sled. When thus piled up they dry thoroughly and burn readily. The logs that are fit for lumber can be separated and put on skids preparatory to hauling to the sawmill in the winter. Among the down logs will be found many logs that are fit for cordwood.

The question of pine stumps has been a bugbear to the cut-over country, and has created an unfair prejudice in the minds of would-be settlers. In very many sections of the North there are no pine stumps, the timber being of hardwood. Even where there are pine stumps, the farmer can make a good living by leaving the stumps alone and converting his land into meadow and pasture, leaving the stumps to be pulled out at his discretion. When it comes to getting rid of the stumps, the farmer has an option of three methods, viz., burning, pulling and dynamiting. Where they are somewhat rotten and open, they can often be burned out by piling plenty of fuel around them. It necessitates steady firing. They can also be pulled with a stump puller when not too large. Last of all, they can be dynamited. The last I believe to be the most economical and best way, in the long run, where the stumps are of considerable size. Dynamite is becoming cheaper each year and is now well within the reach of the average farmer. It can be purchased at from \$12 to \$20 a hundred pounds, which will take care of about 200 big stumps, and possibly more. The lower grade of dynamite, by which we mean 40 per cent nitroglycerine, in our experience has proven both more economical and more effective than the 60 per cent. The lower grade seems to act slower and with more cumulative force. The dynamite comes in one-half pound cartridges, which are fitted with cap and fuse. A hole is made directly under the center of the stump with

a crowbar, the aim being to have the cartridge about two feet below the ground and directly under the center of the stump. The dirt is easily tamped around the opening, and the cartridge is then exploded. The effect is to split it and lay back the parts of the stump, which can be later pulled out and piled up with comparative ease. It is to be remembered that the pine stumps as well as all other trees in the North are entirely surface rooted. The best time to use dynamite is in the wet season. The best effect is often secured when the cartridge is right in water. Good results are obtained also in the spring of the year when the frost is out to a point just below the roots.



Road Making by the Use of the Grader.

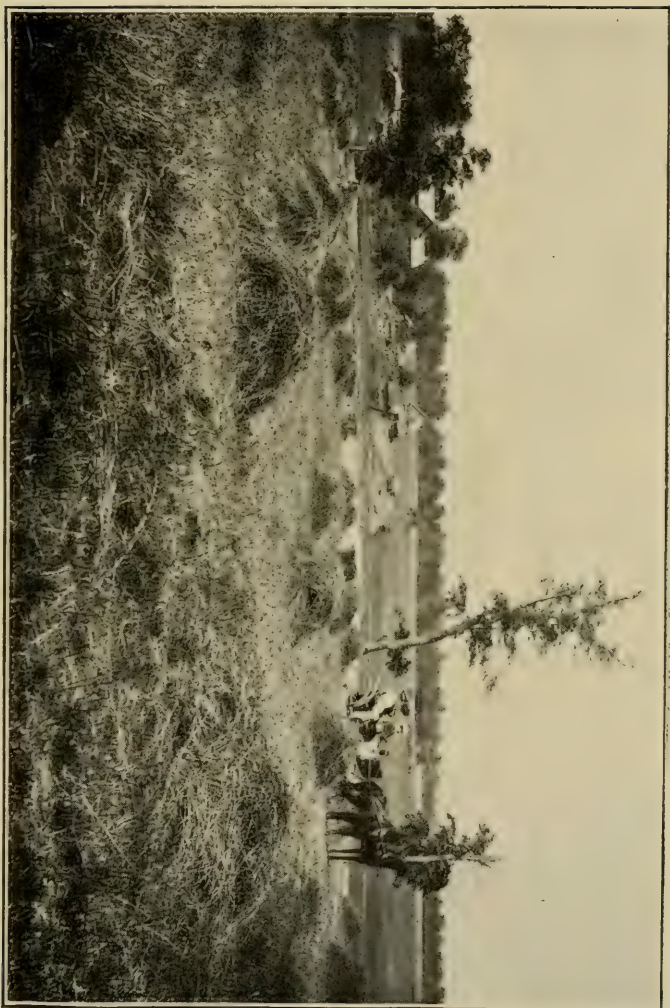
In regions where the Norway pine abounds, there is considerable interest at the present time in regard to turpentine factories. At Hinckley, Minn., there is located one of the first of these factories to be installed in this country, although turpentine factories are common in Europe. The Norway pine stump is very rich in pitch and creosote, and when put through the baking process at the turpentine factory, gives off a fair product of turpentine, with tar and charcoal as residual products. The process is

sufficiently profitable that the factory can afford to remove stumps from a farm for the gift of them, or can pay about the price of cordwood for them delivered. Thus it would seem that turpentine factories will solve the problem of pine stumps in a region where the Norway pine has been numerous. White pine is said to yield too small a per cent of turpentine to make the process profitable.



A Well Made Forest Road.

In mentioning the different points in clearing, we have taken the extreme cases in an endeavor to be absolutely fair to the homeseeker and to tell the whole truth. In justice to northern lands, however, it must be said that there are many tracts that require little or no trouble in clearing. Many of the burned-over districts are free from stumps, windfalls, and are all set in wild grasses. Probably the largest proportion of these lands have light brush and only occasional stumps, and can be made into farms at small expense per acre. The processes of clearing we have described apply only to lands where the extreme cases of clearing are to be done, and cover all phases of work to be done on all classes of land. It is somewhat slower work than on the prairie, but the settler can live more cheaply, improve more cheaply, and have a farm in the end that ought to make him as much money, acre for acre, as most lands in the United States.



Clover and Timothy Seeded in Brush. This Meadow Has Never Been Plowed.

HANDLING THE FARM.

Use of stock—First crops—When to break—
Best rotation of crops—Use
of crops.

The handling of a farm in the cut-over country must necessarily be somewhat different from the procedure on the prairie farm. It is acknowledged, however, that the timber farm is the most productive of all farms, that its grasses are more luxurious and nutritious, and that its grains are more thrifty and of better weight and quality. There seems to be a stamina put into crops grown on timber soils that the prairie and muck lands fail to give. The handling of the cut-over farm determines to a great extent the future success and the profit, and the time it will take to put the wild land on a paying basis. The first inclination is to go at the land with the determination to clear off everything in the way of brush and other accumulations, and make a farm of it straight-way. Of course, enough should be cleared to grow winter feed, but the greater portion of the farm should be left in pasture till its wild nature is overcome. We have previously mentioned the great advantage in using stock of all kinds to beat down brush and



Bees and Potatoes, Two Profitable Industries, the Second Year after Settling.

do all the preliminary work in brushing. The stumps can also be let alone when the land is in meadow and pasture. It must be remembered that the northern country is best suited to grass, hay, small grain and roots. In these particular points the cut-over lands have no superior in the United States. It must also be remembered that these crops we have mentioned can be best used in connection with the growing of live stock and the dairy.

The first thing needed on the farm is probably a small space of cleared land for potatoes, garden truck and small grain. This can be easily obtained on most any tract of land in the North with



**An Old Logging Headquarters Used as Nucleus for the Farm Buildings.
Tamarack Swamp Turned into Meadow.**

very little difficulty. The land will work up into better shape for crops if it has previously had a crop of grass. The northern clay is peculiar in its nature, being very fine in texture and compact. After it has had a crop of grass or two it works up like an ash heap, but if taken in its virgin state it is apt to be a little cold and sour. It should be broken as early in the summer as possible after the spring crops are well out of the way, which will be in late June. The experience with farmers in the North seems to indicate that summer breaking is pre-eminently the best and that late fall breaking is about the poorest; so that if the land cannot be broken in midsummer or before the first of September the break-

ing should be deferred until the next spring. This is especially true of the heavy clay soils. It is best in summer breaking to plow very shallow, turn the sod over in good shape, as a flat sod seems to rot faster, and use a spring-tooth harrow and sow to a crop of rutabagas. The next time the land is plowed it should be stirred a little deeper and put into a crop of small grain, flax probably being the best crop. This method of breaking and plowing has been very successful in changing the land from forest to farm conditions. For land broken in the spring, potatoes are probably the best crop. The yield will not be especially great, but the land will be loosened up and prepared well for oats the following year.



Alsike Clover and Timothy from Seed Thrown in the Brush.

Fodder corn also will do quite well, and we have seen some exceptionally good crops of oats, although it is not usual. The sandy lands will, of course, work into condition much more rapidly than the heavy clays. The proper rotation will probably be found with the following arrangement:

First Year: Potatoes or Corn.

Second Year: Either Oats, Wheat, Flax, or Speltz.

Third Year: Clover and Timothy, seeded with grains above.

Fourth Year: Hay and Pasture.

In this rotation the potato ground will be well prepared for the oats, and usually need only be disked. The clover and timothy can be seeded down with the small grain, and makes excellent hay and pasture for at least two years. The meadow plowed up makes an elegant seed bed for the cultivated crop of corn or potatoes.

The man who is handling the cut-over farm with stock will find several easy methods of saving time and labor in clearing the land. After he has a small patch cleaned up for a garden, he should fence the remainder of his land, cut the brush as he has time or opportunity, and pasture it as closely as possible. In the meantime he should have seeded down in the brush with clover and timothy, as was suggested in the preceding chapter. The wild peas and other wild grasses, where they are abundant, will furnish quite a little food, and the cattle, in tramping through the brush for them, will open a way for the light to come in and start the clover and timothy. The second year there should be any amount of tame pasture, and during this year the farmer should come in and clean the land up, so that he can use a mowing machine. This is a very simple and effective way of getting a very fine meadow, and a great deal of land can be cleaned up in a short time. After it has been in grass for a few years, the farmer can plow as much as desired, and the land will be the better for the grass crops which it has grown. The clover will rot out lots of stubs and stumps and add the humus which the soil needs. Any of the northern land is surprisingly rich in plant food, and the crops of grass merely go to loosen and lighten it up and to put it in proper condition for the seed bed. Where the farmer has neglected to seed in the brush, he can clean the down stuff off and disk thoroughly until the top two or three inches of soil are thoroughly loosened, and then seed in this a seeding of oats, along with which should be clover and timothy. The oats, together with what wild grass and wild peas volunteer, will give a fair

crop of mixed hay the first year, and the second year will give a good crop of clover and timothy.

Hay, for which the country seems to be admirably adapted, is a very important crop. The yield will be from two to four tons per acre of excellent hay. This hay can be fed in connection with the dairy, with sheep, and with stock of all kinds.

"The Land Of Big Red Clover" is an absolutely safe agricultural proposition. The land will become richer every year that clover is grown, and there is no one greater feed for stock. It is the greatest one crop blessing that can be bestowed on any section of country. In the system of permanent agricultural prosperity, clover is more important than corn, wheat or any other one crop.



A Well Made Primitive Log Cabin, Comfortable and Economical.

CROPS.

Wild crops--Tame crops--Grasses--Grains--
Vegetables--Root crops--Wild grasses--
Small fruit.

The typical soil of the cut-over country, by which we mean the clay-loam soil, is peculiarly adapted to a wide variety of field crops, as well as garden stuff and horticultural productions. We see the first evidence of this in the wild, primitive conditions as we first find them. Growing wild in the northern woods are found a wonderful variety of wild grasses and wild fruits of all descriptions. This would seem to indicate that the cultivated counterparts would thrive well, and such we find to be the case. As in all timber soils, grasses are the best crop and of the best variety. As the soil is loamy, we find it especially adapted to all crops of a nitrogenous nature. Leguminous crops are found growing wild in the woods, and all cultivated leguminous crops, such as clover, alfalfa, and peas, are wonderfully productive. The small fruits of the North can hardly be excelled, as would naturally be expected when we find elegant specimens growing wild. A



Clover and Timothy Meadow...Hardwood Timber in Background.

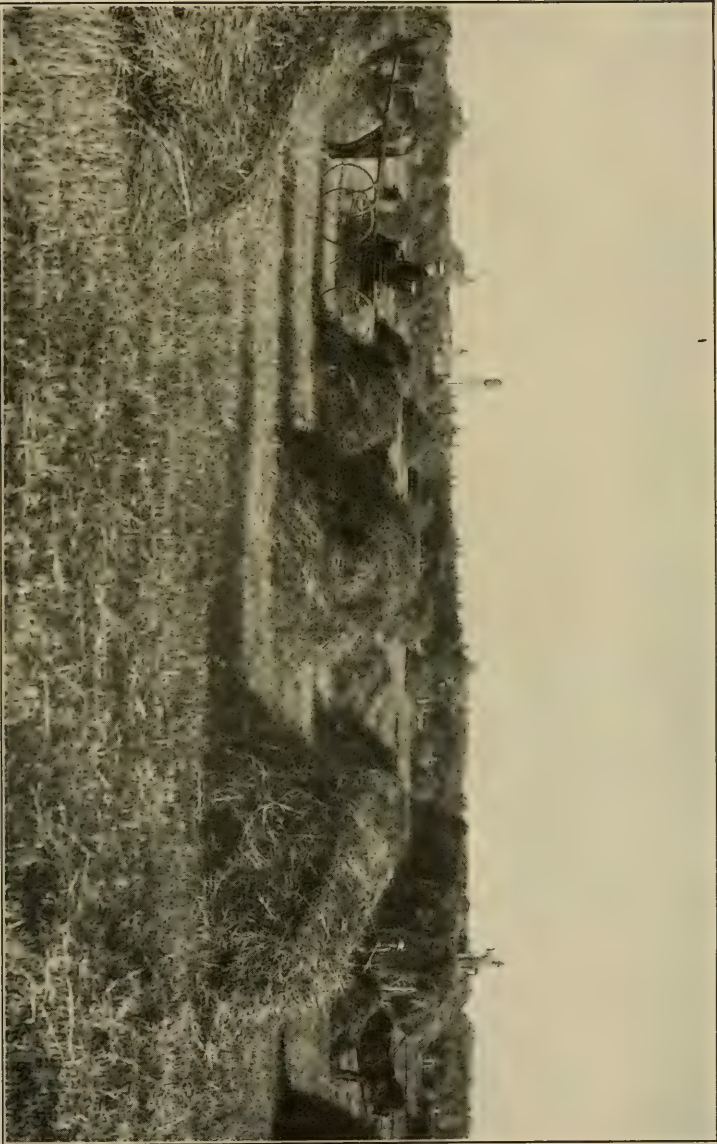
soil of this character is adapted to practically any plant that grows, and the limitations are bounded only by the length of the growing season and other climatic conditions.

Timothy. All over the northern woods, and especially along the tote roads where the lumbermen used to haul hay to the camps, will be found an abundance of timothy and tame grasses. This was the first intimation given as to the agricultural possibilities of the country. The timothy has perpetuated itself there in a wild state year after year, and we find that it has made itself at home all through the woods wherever there has been a chance for the seed to be carried. One of the first steps in getting land into sub-



A Field of the "Big Red Clover."

jection is to scatter timothy seed on the raw ground, either in the brush or after that has been removed. The result is usually a magnificent stand of grass, and I have seen meadows twenty years old that have never been plowed and which were obtained in this way. It is no uncommon thing to see timothy heads twelve inches long and the stem six feet high. Northern timothy has demonstrated its worth by the fact that all recognized hay markets pay a premium price for it, claiming that it has more "strength" as a feed and more quality than similar hay grown on the prairie and other back lands. Timothy will always be one of the first friends



First Growth Clover.

of the northern farmer, and he should utilize it immediately as a pasture and meadow grass.

The Clovers. As before mentioned, all the leguminous plants do wonderfully well. The clovers are best used in connection with timothy. A mixed seeding of timothy and red clover will give a good crop of timothy, with a small amount of clover the first year, for hay, and the second year there should be a mammoth crop of clover. Timothy alone is rather exhausting on the fertility of the land, and clover stores the land with nitrogen, on which succeeding crops of timothy may draw. There is in all countries a reciprocal relation between these two plants, beneficial to both, which meets the wants of the farmer. The red clover is the most commonly used on account of the fact that it makes a



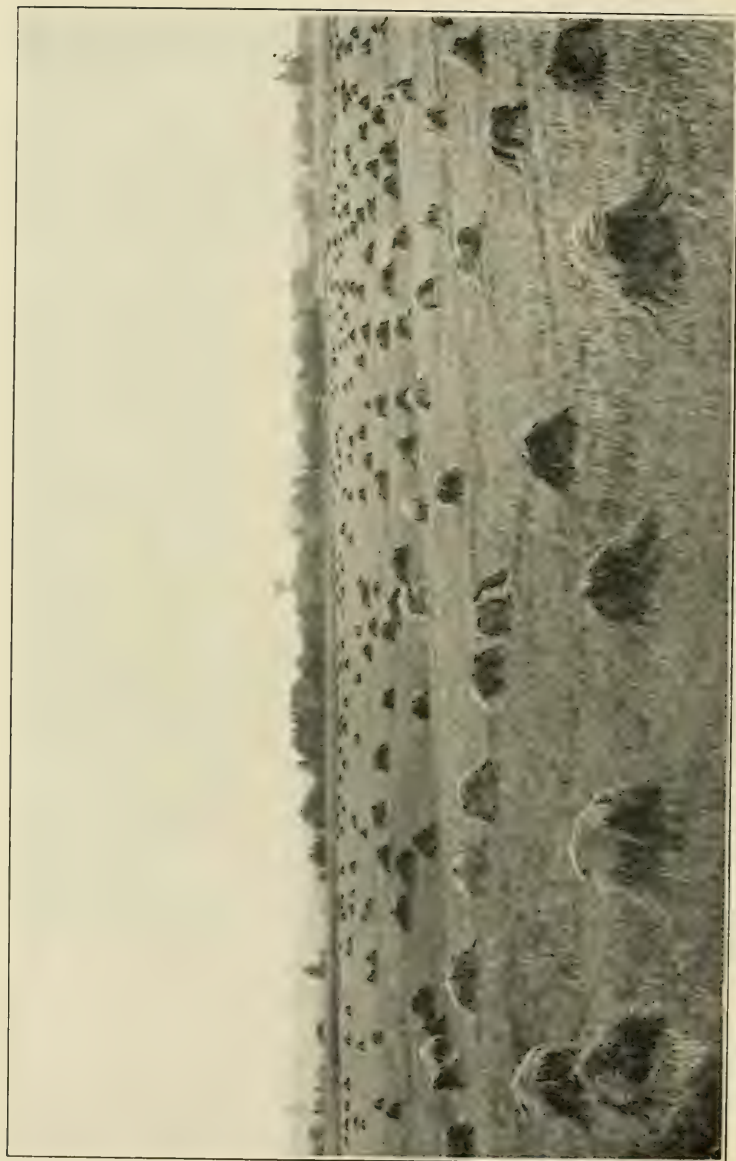
Second Growth Clover.

heavy, rank growth and affords a good aftermath for pasture, and also because the seed is apparently cheaper. In my own practice I always prefer the alsike clover, believing it to be the ideal clover for the North, as but half the seed is required per acre, and it is therefore really cheaper. Its growth is not quite as rank as the red or mammoth, but it is a perennial, coming up year after

year, whereas the red clover usually dies after the second year. Its stems are more digestible and the hay is a great deal cleaner and of a better quality. It is also more easily cured, and is especially adapted for the wet lands and, like all clovers, is a subsoiler, its roots growing down for a long distance, loosening by dividing the compact loam soil. It is valuable in this respect in the North, because the heavier soil is more or less compact after the brush is cut off. For all-around use I believe that alsike clover will prove to be the ideal variety for the North. White clover is practically a weed, and it makes a much larger growth and seems almost like a different variety from the white clover of the central states, being larger in stalk and especially in bloom. In places in the woods where the sun has had a chance to warm the ground we find little patches of white clover, and it seems almost beyond comprehension that the seed should be carried there, which, however, it must necessarily have been. Along the roadside, around the house, and practically everywhere we find white clover has volunteered in place of some noxious weed, as would be the case in other countries. The northern white clover is a fairly good pasture grass, and coming up with red top, as it usually does, is quite valuable for pasture, considering that no expense has been incurred in securing it. These two grasses can almost be assured without seeding on any land that has been cleared.

Red Top. Red top is also quite a valuable plant in the cut-over timber country, and seems to be of more use and of better quality than in other sections. It is best adapted to the wettish spots, where it usually will appear of its own accord. A mixture of alsike clover and red top makes a good seeding for semi-wet conditions, provided the water never stands high enough to cover the leaves and thus smother out the clover. When cut early enough, red top makes a fair quality of hay; in fact, has more food content than is generally supposed; but it must be cut early, else it becomes woody.

Blue Grass. Blue grass thrives well in the North, and, as everywhere else, makes a valuable pasture grass, especially for



A Typical Field of Oats. The Northern Soil and Climate Is Ideal for Small Grain.

sheep and horses. It is found growing along the roadside and anywhere else that there has been a chance for seed. In this it is like the clovers. The English blue grass or meadow fescue will also probably prove a valuable grass in the North. It is different from the ordinary blue grass in that it is a perennial, and is especially adapted for the late fall and early spring.

Oats. Oats is probably the best field crop in the North. It usually finds a ready sale in the city and in the lumber camps, and, when not bringing a sufficient price on the market, can be fed out on the farm to good advantage to the horses, milk cows,



This Farm Changed from Brush to Cultivated Fields in Three Years.

sheep and swine. The climate is especially adapted to small grains, and more especially to oats. In the first place, a splendid seed bed can be prepared in the spring, as the seeding operation can be delayed a little longer than further south. The nights are cool, with heavy dews. The rainfall comes about the seeding period, and again at the ripening period, causing a sturdy stalk, which matures out a heavy, meaty kernel. I have had in my own experience oats weighing over forty pounds to the bushel, with a kernel almost like barley and possessing wonderful feeding qual-

ities. The yield will run from forty to ninety bushels per acre, averaging around fifty bushels year in and year out. Northern oats very rarely run under the standard weight per bushel, but usually far above. Oats followed by a seeding of clover or timothy fits nicely into the proper rotation, which I have discussed in another chapter.

Barley. Barley is also a very good crop, not as yet very extensively grown because the northern farmer has failed to grow the proper stock to which to feed it and has depended on selling it. He has also not learned as yet how to care for it to secure the highest grade. We might possibly except the Wisconsin farmer,



Barley on an Improved Farm. Originally Cut-over Land.

who has a great reputation as a grower of high-class barley. The yield is very good as a rule, and the grain has heavy kernels. When mixed and ground with oats, barley makes an excellent feed for the dairy cow, and is a suitable substitute for corn in fattening swine. Barley and clover fed hogs have a great reputation on account of the fine, sweet bacon and hams which these feeds produce.

Speltz. Speltz is well adapted to northern conditions and yields well as a usual thing. The consensus of opinion among

good farmers and agricultural authorities, however, would seem to indicate that speltz is not a profitable grain to grow where good oats and barley can be grown. Its hard shell around the kernel is its objectionable feature.

Flax. Flax is quite a successful crop, and finds its best use as a first crop on new breaking, which is usually a little hard to get into subjection. It can also be planted late in the spring, after other grains have been seeded. It is usually grown in the North as a makeshift in this way. It will be unfortunate if the time ever comes when these grains will be grown as commercial crops. The northern farmer should confine his attention to the live-stock business and grow only such grains as he can profitably feed, thus conserving the fertility of his farm.

Corn. Many farmers condemn a country that will not grow Indian corn. Those who are conversant with the question of permanent agricultural fertility would, however, rather give up corn than the clovers. It must not be understood that corn cannot be grown in the North. For the growing of fodder corn the country cannot be excelled. The past year of 1905 there could be seen well-matured corn all along the northern boundaries of the three states under discussion. It was mature at practically the same time as corn in Northern Iowa and Illinois, thus indicating that in favorable seasons corn can be quite successfully grown on a limited scale, all over the cut-over lands. In sandy soil it will mature even under unfavorable conditions. Corn will find its best use in the North, however, as a silage and fodder crop, and in this respect will be quite as valuable as anywhere else. In the North the corn leaves and stalk are very fine in quality, and the whole plant will be eaten up completely by live stock. The northern fodder is therefore of more value as a stock food than for ton, than the fodder of the South.

Peas. In another chapter I have devoted considerable attention to the wild peas and beans found in the northern woods. The tame peas do almost as well. The garden peas grow to great perfection. As yet the Canada field pea has not been extensively

grown, but in most vicinities there is no reason why it should not be a feed of great value for live stock of all kinds, as has been demonstrated by Ontario farmers. There may be a slight difference in the growth in some soils over others, preference probably being for the heavy clay soils.

Vegetables. It would seem that in no place in the world can better garden truck be grown than in the cut-over country. Produced, herewith, is an illustration of 153 different varieties of vegetables exhibited at one county fair in the region under discussion. There is practically no limit to the success of the truck gardener.

Root Crops. The porous, loamy soils and the sandy soils are especially adapted to root crops of all kinds, and the yields are nothing short of phenomenal. Northern Minnesota, Northern Wisconsin, and Northern Michigan have long been known as the great potato districts, and these districts furnish a large share of the seed potatoes for the United States, as well as supplying a good share of the regular market supply. Northern potatoes have an exceptional quality and yield, and, until the country settles itself to permanent agriculture, afford the farmer a good revenue. As a first crop, potato growing will always be extensively carried on in the North. But the time will come when the potato crop will not be entirely depended upon for revenue, as it is in some cases now. However, a small acreage of potatoes for a cash crop will probably always be grown on most farms. When the market is not especially good for profitable sale, the many starch factories located over the whole district will absorb the cheap product as well as afford a market for the culls in ordinary years. All other classes of roots aside from potatoes do well. Mangels, sugar beets, rutabagas, carrots, and other like roots yield as well as any place in the country. The fertility of the soil and the porous condition of the lighter soils seem to just fit the requirements for roots. There is no limitation to the quantity and variety of roots which the stockman may grow if he wish, and unless the northern farmer wants to put up a silo, there is nothing which will better supple-



Vegetable Exhibit at a Northern Minnesota County Fair. 153 Varieties.

ment his hay and grain rations than roots. The growing of sugar beets for factories is also getting to be more of a business each year in certain localities.

Wild Grasses. Growing wild in the brush and woods in practically all sections of the cut-over country are found many varieties of grasses and plants, most of which are very good for pasture and hay. The native grasses usually found are red top and blue stem grass, different from the blue stem of the prairies further South, but a fairly good grass, usually found in the natural meadows. They make very good pasture grasses, and also good hay when cut sufficiently early and properly cared for. This sort of hay is best suited for horses or as roughness for cattle and sheep, and grades in quality quite high for wild hay. There are also found several specimens of the brome grasses and other wild grains which make desirable feeds. But the most desirable natives from the standpoint of the stockman are the wild vetches belonging to the family Leguminosae, the same family which has furnished the noted clovers, alfalfa, cowpeas, soy beans and a host of others, all noted as great stock food and soil enrichers. The wild legumes are locally known as vetches or "wild peas" and "wild beans." Some of the varieties strongly resemble the garden bean, and others resemble alfalfa, and still others resemble the members of the pea family. They are as good feed, pound for pound, as alfalfa or the clovers which belong to the same family as the wild peas. The peas are found growing among the stumps and brush, thriving best where the land has been burned over, the burning seeming to give them a better access to light and more growing space. Where at all numerous, they literally mat the ground and climb as high on the brush as it will allow. When found in the brush in this way they make a most valuable pasture for all kinds of stock, and especially for young stock and milk cows. Local butchers often remark that cattle fattened on wild peas have a finish almost equal to grain fed stock. Dairy cows give an excellent flow of milk when feeding on peas, and when the pea pasturage is exhausted the effects are soon noted in the de-



Harvest Scene. [Photo by Claggett.]

crease of milk. Cattle and horses seem to prefer such pasture to all others, and they will often leave good tame pasture and roam through the woods to pick up the succulent pea vines.

There are at least three and perhaps more varieties of wild peas. The largest growing and most valuable variety seems to grow mostly on high land. It has pinkish colored flowers growing in clusters. Its leaves are much like those of the garden pea, but more numerous and are larger. The stem is much like the clover stem. The smaller varieties are distinguished by single flowers of either blue or white color. These varieties are smaller in every way and seem to thrive best on lower land. They are the true vetch. During the last year or two, farmers have discovered that when land, which is seeded to any extent with the wild pea, is cleaned up and burned over, a fine crop of wild peas will volunteer the following season. This crop will produce a heavy yield of hay. Such hay will equal the very best tame hay, and is probably just as valuable as alfalfa. In feeding several tons of such hay the past winter the writer found it especially valuable for horses and milk cows. Chickens are also very fond of it. It should also be very valuable for sheep. The vines are cut for hay when the peas are well podded, but not too ripe. They should not be allowed to lie upon the ground too long, but instead raked up while quite green and allowed to cure in the cock. In this way all the fine leaves are saved, and it is in these leaves that the valuable part of the feed is found.

The pea grows from a small hard seed about the size of a sweet pea seed, and also from a thick underground stem, from which new vines come up each year. A wild pea stand should endure for several years, unless crowded too much by other grasses. On the roots of the peas will be found nodules similar but very much larger than those growing on the clovers.

The wild beans are similar in appearance to the garden bean, although smaller. They are found principally in the maple groves or shaded spots. They grow in a thick mat all over the ground.

Stock love to pasture upon them, and the results seem to be quite satisfactory.

Through the courtesy of Prof. Holden, the writer has obtained a partial analysis of two varieties of wild peas. In the table below is given the percentage of protein or flesh-forming ingredients. There has also been noted the protein analysis of other legumes, together with the protein content of bran and middlings.

	Water	Protein	Ash	Carbohydrates.
Red Clover	20.8	12.4	.....	.....
Alfalfa	8.4	14.3	.....	.....
Cowpeas	10.7	16.6	.....	.....
Soy Peas	11.3	15.4	.....	.....
Wild Peas (Large)	8.8	16.4	.....	.....
Wild Peas (Small)	8.7	15.6	.....	.....
Middlings	12.1	15.6	.....	.....

The experience of farmers in feeding wild pea hay has been quite satisfactory, as the above table would lead us to expect.

With more information in regard to these seemingly valuable plants, it may be found that in the wild peas and beans the northern farmer, as well as farmers everywhere, will have added to agriculture another valuable legume. Experiment alone can tell how they will stand civilization. At any rate, it is a comfort to the northern farmer to know that growing wild he has a plant which is as valuable to him as alfalfa and the clovers which are coveted in so many countries where they cannot be grown.

Small Fruits. As before mentioned, small fruit is at its best in the northern soils. If the farmer does not desire to take the trouble to pick the wild raspberries, strawberries, blueberries, dewberries, Juneberries and cranberries, he can grow the finest kind of tame berries of the same varieties. Northern Minnesota straw-

berries were pronounced the peer of the country at the St. Louis Exposition. There are more apples being grown in the North every year, and there seems to be no reason why any farmer should be without his orchard. Fruit trees should not be planted,



One Tree of an Apple Orchard near Duluth.

however, until the land is pretty well under subjection, and the young trees will probably have to be a little more protected than elsewhere.

NORTHERN LANDS FOR STOCK.

Dairy cattle—Beef cattle—Sheep—Bacon—
Hogs—Horses.

Northern lands are pre-eminently fitted for live stock of nearly all descriptions. This is fortunate, inasmuch as it would be a long time before the country would be cleaned up if the object in view was to make grain farms. As it is, the northern farmer can get an income right away from his stock, and at the same time the stock is working for him better than servants in the way of beating down brush and clearing up the land. There has long been an impression among farmers in more southern sections that the climate of Northern Minnesota, Wisconsin and Michigan was too severe for any but the hardiest class of live stock. We have only to look over in the same latitude into Ontario, that great province of stockmen, to see what can be accomplished in the North. All this section of country is as well adapted to the live-stock business as Ontario. The climate in winter is quite cold, but it is a dry, even cold without extremes of temperature, and the animal suffers no more than in the South if properly cared for. Nature provides a heavy coat of hair and acclimatization soon takes place.

Dairy Cattle. The many clear streams of pure water, the nutritious grasses, and the high quality of hay, especially clover hay, the excellent assortment and quality of small grain, and the prodigious root crops, make up an assortment well suited to the needs of the dairyman. In summer the dairy cow will need little but the native pastures, and she can graze just as well among stumps as on the prairie. The wild vetches especially stimulate the milk flow. Land that is well set in tame grass and cleared will often support a cow to the acre during the summer season, which cannot be said of many farming countries. In winter a



The Dairy Cow at Home in the Stump Pasture,

good ration can be made up of clover, of mixed clover and timothy, hay, some roots, either mangels or carrots or rutabagas, and a small amount of bran. Wild pea hay and corn fodder, which can be grown to great perfection, with a little bran and oats, also makes an ideal ration. All things considered, the dairy business is the one great business for the North, and there is no reason why the northern parts of the states we have mentioned should not become the great dairy region of the United States. The environment, the feeds and the markets all conspire to this end.

Beef Cattle. While the North is best adapted to the dairy business, in time to come there will probably be more or less attention paid to the growing of beef cattle. They can be grown to



Cattle and Sheep Soon Find a Place on the Improved Farm.

maturity and sent to market off grass in very good condition. Corn is not, of course, an absolutely dependable crop, and any other feeds would be too expensive to fatten cattle; hence beef production will probably be limited to the growing of steers for feeders, or to summer pasturing. The fattening of beef cattle can be better conducted in the corn belt.

Sheep. The fact that the requirements of feed for sheep are practically the same as the requirements for the dairy cow

would seem to indicate that the country is clearly adapted for sheep, and the facts confirm this. The cold, dry climate is excellent both for the stimulation of a dense, fine fleece and for the hardiness and vigor. Sheep can stand extreme cold far better than damp weather, and the northern climate is finely adapted to their needs. Disease is very rare. A flock of sheep will also do valiant work in destroying underbrush and fine stuff that other live stock would not relish. Trouble from wolves does not seem to be any greater than in well-settled countries. It is rather surprising that there are not more sheep ranches in the North. Those few that have come under our notice have been uniformly successful. The experienced sheepman will agree with the statement that an excellent climate, plenty of pasture, clover, hay, small grain and roots make up an ideal combination for sheep production both in regard to wool and mutton.

Swine. It is a well-known fact that pork production can be most economically maintained in connection with the dairy. There are no cheaper feeds than skimmed milk and clover for making bone and muscle. The question will come up in the minds of many as to what will be used in fattening hogs. The bacon, and not the lard, hog is the hog for the northern conditions. The bacon hog fit for market will weigh from 160 to 200 lbs. at seven months, and will be raised on skim milk, clover, roots and barley. All these feeds can be very cheaply produced in the North. In connection with the dairy the bacon hog can be very economically produced and furnish as much profit as the hog of the corn belt. The world-famed English breakfast bacon is made from this class of hogs. Although it may not be generally known, a very large per cent of the premium bacon and hams sent out by the large packing establishments in the United States are culled from northern light-weight hogs, and are raised in this section of country. Very little attention as yet has been paid to the bacon hog, but in time the business of producing the highest class ham and bacon of the world will be centered in the cut-over country, which is the ideal environment. Tamworth, Yorkshire and some

of the Berkshire types are ideal bacon hogs, but practically any breed taken to the North and fed highly nitrogenous food will assume the same type in time.

Horses. Good grass and hay and plenty of clean, heavy oats make up a good and economical ration for raising horses. Horses suffer from cold less than any other class of stock, and they thrive splendidly in the North. Northern-grown horses are exceptional for their stamina quality and clean bone, partially due to their food and partially due to climate. They can be produced about as cheaply in the North as probably any place in the United States, all things considered. The logging camps, iron



A Pair of Northern Minnesota Yearlings, Grown by the Author.

mines, and western harvest fields will furnish a splendid market for all horses that can be produced in the North for some years to come. The illustration produced herewith shows a pair of yearling colts raised by the author on a Northern Minnesota farm.

SUMMARY.

People who buy land—Northern markets— Future of northern lands.

In speaking of the various phases of the land situation as it exists in the cut-over country, and in speaking of the ways in which this land can be handled, the writer has endeavored to be absolutely fair and unprejudiced. The advantages have in no manner been intentionally overdrawn or overrated, and the disadvantages have been discussed as well as means to overcome them.

The country described is an ideal place for several classes of people who under present conditions find it difficult to obtain a farm in other localities. First, the renter, who, because of the fact that rental prices in old-established countries have risen to the point where he cannot make a living desires to find a new opening. Second, there is also the man who, because of high prices, has sold his farm and desires a new location. Third, there is also the immigrant, who wants a home in America. Fourth, is that last class of people made up of the overworked and the unemployed in the city. There are thousands of people in each of these classes in the United States looking for land today. And the cheap lands of the cut-over country offers to each one an unexcelled opportunity. These lands are the poor man's opportunity, and nowhere else in the United States can he go with as dead certainty of success in the long run, provided he is industrious. He can live cheaply, improve his farm cheaply, and have permanent work the year round. Milk cows will make him a living from the start, if he will but study and milk. When his farm is entirely cleared, it is as valuable and will make him as much money per acre as farms in almost any country. Although presenting great opportunities to the poor man, there are still greater opportunities presented to the man of means.

These lands are all sold on easy terms. A small payment need only be made at the start. For the remaining payments there is allowed almost unlimited time, all the way from five to forty years, with low rate of interest. This arrangement allows practically anyone to buy a home.



One of Many Progressive Northern Towns. The Cream Business in This Town Is but Two Years Old. Scene Shows the Daily Shipment to the Central Market.

Market facilities are unsurpassed over practically the entire cut-over country. Northeastern Minnesota and Northwestern Wisconsin lands lie practically midway between the two great markets of Duluth and Superior on the north and St. Paul and Minneapolis on the south. Then, there are all the good sized Wisconsin and Michigan cities to supply the eastern sections of the cut-over country with ready markets for practically everything the farmer will raise.

In this booklet are described only a few of the many crops grown. Especial stress has been placed only upon those crops for

which the country seems best fitted. The entire cut-over country some day will be known principally as a dairy section,—probably the foremost dairy section of the United States. Along with the dairy will come bacon hogs and sheep. The country is especially fitted for this phase of agricultural industry. And necessity will compel the farmer to bend his efforts in this direction.

There are no two factors which point so assuredly to permanent agricultural prosperity as the clover plant and the dairy cow. It means fertile land forever, and assured success for anyone who sticks to the combination.



A Pleasure Trip on Lake Pokegama, One of the Many Northern Lakes.

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